

MINUTES OF DOT-AGC BRIDGE DESIGN SUBCOMMITTEE MEETING

The DOT-AGC Joint Bridge Design Subcommittee met on June 7, 2004. Those in attendance were:

Berry Jenkins	Manager of Highway Heavy Division, Carolinas Branch AGC (Co-Chairman)
Greg Perfetti	State Bridge Design Engineer (Co-Chairman)
Paul Lambert	Structure Design Project Engineer
Tom Koch	Structure Design Project Engineer
Ron Hancock	State Bridge Construction Engineer
Chip Murray	Carolinas Branch AGC
Chris Britton	Taylor and Murphy Construction Co.
Richard Holshouser	Sanford Contractors, Inc.
Mark Lively	Crowder Construction
Bryan Long	Dane Construction, Inc.
Chris Kreider	Operations Engineer - Geotechnical Engineer Unit
David Greene	Structural Members Engineer - M&T Unit
Gichuru Muchane	Structure Design Engineer
Gary Rhodes	Gerdau Ameristeel
Paul Morin	Gerdau Ameristeel

The minutes of the April 14th, 2004 meeting were approved.

The following items of new business were discussed:

1. Presentation on Welded Hoops

Mr. Rhodes and Mr. Morin gave a presentation on the use of welded hoops as an alternative to spirals in drilled shafts and columns. In addition they showed some weld samples. The hoops are flash welded in the shop, and 3 out of every 150 hoops are pull tested to ensure adequate weld strength. The hoops can be produced for #6 - #9 bars in diameters ranging from 2'-6" to 13'-6". A #6 hoop is typically spaced at 6", and is tied at each vertical bar intersection. Mr. Morin stated that welded hoops allowed a tighter tolerance and could be spaced more uniformly in a typical reinforcement cage. He added that the hoops were competitively priced and that using hoops has resulted in an increased worker productivity due to an estimated 50% time saving in tying the hoops to the vertical reinforcing steel.

Mr. Hancock inquired if the excess weld material seen on the sample welds would reduce the concrete cover at each weld. Mr. Morin responded that the excess weld material around the welded joint could be removed, but it has been shown to enhance the strength of the weld because it provides additional cross-sectional area to the welded joint. Mr. Perfetti stated that the majority of NCDOT projects require #5 spirals. He expressed some concern regarding replacing #5 with #6 spirals due to the volumetric changes in steel with respect to concrete.

Mr. Koch pointed out that hoops were used in the past and that spirals were adopted because of improved confinement characteristics. He inquired why these welded hoops are an improvement over previously used hoops. Mr. Morin responded by stating that the welded hoops are much less susceptible to "cascading" failure that was observed in hoops that were terminated with hooks.

Mr. Greene inquired if any hardening testing has been performed in the weld area. Mr. Morin stated no. Mr. Greene requested a few samples to be tested by the Materials and Test unit.

The Department has considered a proposal to substitute spirals with welded hoops on a current project. No further proposals will be entertained until successful completion of the current project.

2. *Crane Operator Certification*

Mr. Jenkins stated that Mr. Ellis Powell, State Construction Engineer, had initiated the idea of developing a Certified Crane Operator (CCO) program. Mr. Jenkins introduced Mr. Murray who has been involved in developing CCO programs for Carolinas AGC in South Carolina.

Mr. Murray reported that following several accidents involving cranes in South Carolina, the FHWA requested documentation on crane inspection and training. As a result of this audit, South Carolina has mandated CCO beginning January 2006.

Mr. Murray discussed differences between the CCO certification and National AGC program.

Mr Jenkins suggested the NCDOT consider 1-2 year time frame for implementing a certification program.

Mr. Lively expressed concern that some of the best operators with over 20 years of experience could not pass the written test and as a result cannot work in states with CCO requirements. Mr. Holshouser added that operating a crane is very dependent of soil conditions and a site specific crane erection plan. Mr. Holshouser stated that any crane certification requirement should be for CCO or equivalent, not just CCO. He also suggested each contractor train an in-house trainer, who can then train other crane operators.

Mr. Hancock stated that for now we will maintain the status quo, however NCDOT is interested in a certification program similar to the CCO, National AGC, or equivalent.

3. *CSX Ruling on Crane Capacity*

Mr. Hancock reported the CSX recently provided clarification and will require contractors to use a crane with a capacity of 150% above the rated operational crane capacity. Furthermore, none of the factor of safety incorporated into the crane charts will be allowed to contribute to the 150% rule. In addition, they will require an erection plan that is sealed by a registered professional engineer. He stated that the requirements were intended to protect the railroad during erection, and that Norfolk Southern will also have similar requirements. Mr. Hancock stated that the railroad requirements would be clearly stated in future special provisions.

Mr. Jenkins expressed concern that some contractors will not bid on jobs that are in the vicinity of a railroad as some crane equipment rental costs are prohibitive.

4. *Other*

- i. Mr. Hancock reported that availability of cement has become a big issue in recent weeks. Mr. Holshouser added that some suppliers are not accepting new customers, and they now require existing customers to provide several weeks notice before shipping.

- ii. Mr. Perfetti discussed a new plan detail for utility pipes through backwalls. Oversized holes in end bent backwalls will be detailed with filler material, meeting the requirements of Section 1028 of the Standard Specifications, around the utility pipe.
- iii. Mr. Perfetti reported that Structure Design continues to develop the standardized tables and details for overhang falsework, embedded clips, and steel diaphragms. He added that standardized overhang falsework details were being included in 2 sets of contract plans in the August letting.
- iv. Mr. Hancock stated that the Construction and Structure Design Units are working towards eliminating sawed joints in concrete. The joints will be formed and filled with elastomeric concrete, which will then be sawed to create the required opening for installation of the joint seal.
- v. Mr. Lively stated that bridges with integral end bents need larger cranes than conventional end bents. This is because at the time of girder placement, the backfill is not in place and the cranes must sit away from the bridge. He added that the alternative to a larger crane is to place the girders from a crane located below the bridge. He also suggested that the 6 foot portion of deck slab that is left open until the abutment pour is made, is an area of safety concern because safety railing is temporarily removed to accommodate the screed rails during the main deck pour. He suggested allowing a 10" backwall pour, which will allow the reinforced backfill to be placed, and he added that SCDOT had plan details that worked well.
- vi. Mr. Britton stated that shoring on phased culverts is often problematic. He suggested allowing a taller headwall on the culvert in lieu of shoring. Mr. Krieder stated that a taller headwall would have to be designed, and he added that he would investigate whether use of a fabric wall in lieu of shoring would be more appropriate.

5. *Next Meeting*

The next meeting is scheduled for August 11th, 2004 in the Structure Design Unit conference Room C.